METHOD AND APPARATUS FOR CONTROLLING POWER CONSUMPTION IN A TILT CORRECTING COIL

CLAIM OF PRIORITY

This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. §119 from an application entitled *Method For Controlling Power Consumption In Tilt Correcting Coil* earlier filed in the Korean Industrial Property Office on Apr. 26, 1997, and there duly assigned Serial No. 15728/1997.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a monitor which includes a cathode ray tube as an image displaying device, and is a peripheral equipment of a computer system, and more particularly, the present invention relates to a method and apparatus for controlling the power consumption in a tilt correcting coil for correcting the tilt of the images of the cathode ray tube, in which the power consumption is corrected in the tilt correcting coil.

2. Description of Related Art

Generally, a monitor is a peripheral equipment which makes it possible for the user to monitor and confirm the operating state of the computer system. The computer system outputs data signals indicative of the current operation, while the monitor receives the data signals to display them on the screen of the cathode ray tube. When the monitor displays the data signals as image signals on the screen, horizontal and vertical synchronizing signals are utilized. Therefore, the computer system outputs horizontal and vertical synchronizing signals as well as data signals.

When the user leaves the computer system for a while to take a break or perform some other business, the computer system remains with the power turned on. Thus, when the computer system is idle, as in the above described case, the computer system consumes more power than necessary. Therefore, conventional computer systems monitor the activity of a keyboard, a mouse or modem to determine whether the user is using the computer system.

When it is determined that the keyboard and/or mouse have remained inactive for a predetermined time period, power consumption is reduced based on the time period of inactivity. That is, the computer system is sequentially operated in several power modes depending on the time period of inactivity. In an on-state mode during user activity normal power consumption occurs, during periods of inactivity power consumption is reduced by sequentially operating in a standby mode, a suspend mode and a power-off mode. When the activity of the keyboard and/or mouse is again detected, the on-state mode of the computer system is resumed.

Meanwhile, the Video Electronics Standard Association (VESA) of the United States proposes a display power management system (DPMS) which is capable of managing the monitor power for the current mode and capable of reducing power consumption. The DPMS is capable of managing the power supplied to the respective sections of the computer based on the state of use (activity state) of the computer system. The computer system selectively outputs horizontal and vertical synchronizing signals in accordance with the power supply mode of the DPMS.

The monitor operates under an on-state mode, a standby mode, a suspend mode or a power-off mode in accordance with the presence or absence of the horizontal and vertical synchronizing signals. That is, when both the horizontal and vertical synchronizing signals are output, the monitor operates under the on-state mode. When the horizontal synchronizing signals are not output, but only the vertical synchronizing signals are output, the monitor operates under the standby mode. When the vertical synchronizing signals are not output, but only the horizontal synchronizing signals are output, the monitor operates under the suspend mode. When neither the horizontal nor vertical synchronizing signals are output, the monitor operates under the power-off mode.

When the monitor operates under the on-state mode, power consumption of the monitor is about 80–100 W. Under the standby mode, it is about 65 W or less. Under the suspend mode, it is about 25 W or less. Under the power-off mode, it is about 5 W or less.

When the monitor displays images on the screen, the images can be tilted due to a deflection inaccuracy or the like. Therefore, the neck portion of the cathode ray tube is provided with a tilt correcting coil together with deflection coils to generate deflection magnetic fields. Owing to the function of this tilt correcting coil, the images are displayed on the screen in a correct form.

In the above described monitor, conventionally, the tilt correcting coil receives tilt correcting signals continuously to correct the tilts of the images, regardless of the DPMS modes. The power consumption of the tilt correcting coil is pretty high. That is, it is as high as 2–3 W. Therefore, under the power-off mode, the power consumption definition of the DPMS cannot be satisfied due to the power consumption of the tilt correcting coil.

Further, under the standby mode and the suspend mode, no image is displayed on the screen. However, the tilt correcting coil receives the tilt correcting signals continuously, with the result that power is squandered.

SUMMARY OF THE INVENTION

The present invention is intended to overcome the above described disadvantages of the conventional technique.

Therefore it is an object of the present invention to provide a method for controlling the power consumption in a tilt correcting coil, in which the power consumption in the tilt correcting coil is eliminated when the DPMS mode is one of the standby mode, the suspend mode, and the power-off mode.

It is another object of the present invention to provide an apparatus for controlling the power consumption in a tilt correcting coil of a monitor operable in a DPMS mode, wherein the DPMS mode is one of a standby mode, suspend mode, and power-off mode, by preventing a tilt correcting pulse width modulated (PWM) signal from being provided to the tilt correcting coil.

In achieving the above objects, the present invention is characterized in that a microcomputer determines the current DPMS mode in accordance with the presence or absence of horizontal and vertical synchronizing signals input from the computer system. If the microcomputer determines that the mode is the on-state mode, then the microcomputer outputs the tilt correcting PWM signal. Then the output tilt correcting PWM signal is converted into a dc (direct current) voltage, and the level is adjusted. Then the signal is supplied to the tilt correcting coil, so that the tilt of the image on the screen is corrected. When it is determined that the DPMS mode is one of the standby mode, the suspend mode and the power-off mode, the microcomputer outputs a signal having a predetermined logic level for minimizing the power consumption of the tilt correcting coil.